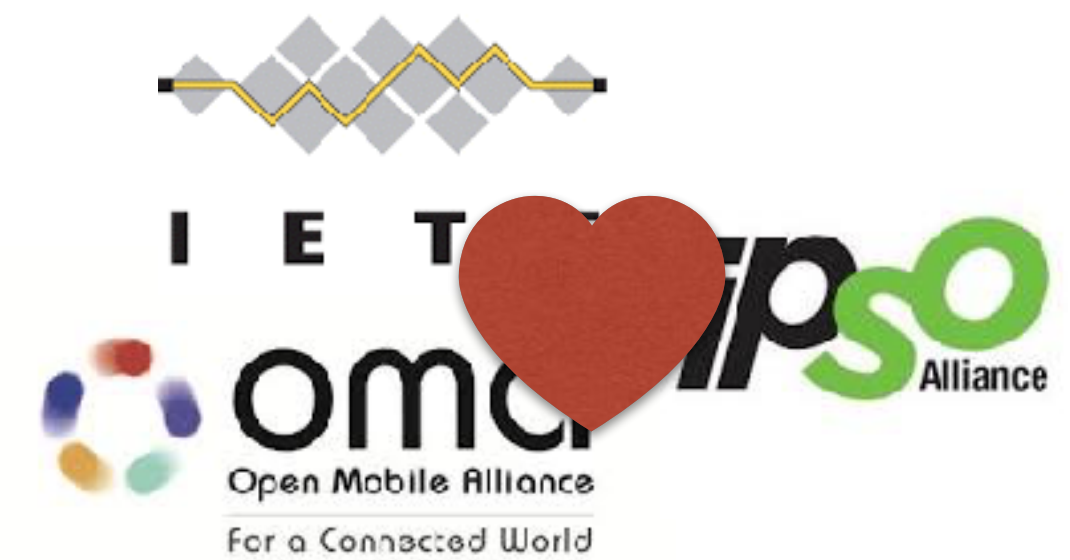


OMA, IPSO & IETF CoRE



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IETF CoRE WG Co-Chair

IPSO Smart Objects chair



@jaim - [jaimejim.github.io](https://github.com/jaimejim)

OMA F2F - Warsaw



Standards built on each other

IoT Standards That Build On Each Other

2014

- CoAP and related standards from IETF
 - REST API for constrained networks and devices
 - HTTP Proxy provides abstraction through standard web APIs
 - Core-link-format (RFC 6690) provides semantic descriptors in the form of web links
 - Resource Directory provides an API for scalable discovery and linking using core link-format mediatype
- OMA LWM2M is based on CoAP
 - Provides a server profile for IoT middleware
 - Defines a simple reusable object model
 - Defines management objects and reuses REST API for onboarding and device life cycle management
- IPSO Smart Objects are based on OMA LWM2M
 - Defines application objects using the LWM2M Object Model
 - Complex objects can be composed from simple objects
 - Easy to add new resource and object types as needed

IPSO Smart Objects

- Based on the LWM2M Object Model but for Application Data.
- Domain-specific objects created by vendors themselves.
- Provides a consistent Design Pattern and Reusable Resource Definitions.
- Non-mandatory resources can be modified, new Objects can easily be added and automatically validated.
- Released Objects are registered in OMNA and use the standard OMA DDF (XML) object descriptors.
- 53 Objects (temperature, ... stopwatch), registered with OMNA and 100 Reusable Resources.
- Openly available and easy to contribute: <http://ipso-alliance.github.io/pub>

IPSO Smart Objects

- Object representation as in LWM2M

`<object ID>/<object instance ID>/<resource ID>`

- URI

`coap://device1.example.com/3303/0/5700`

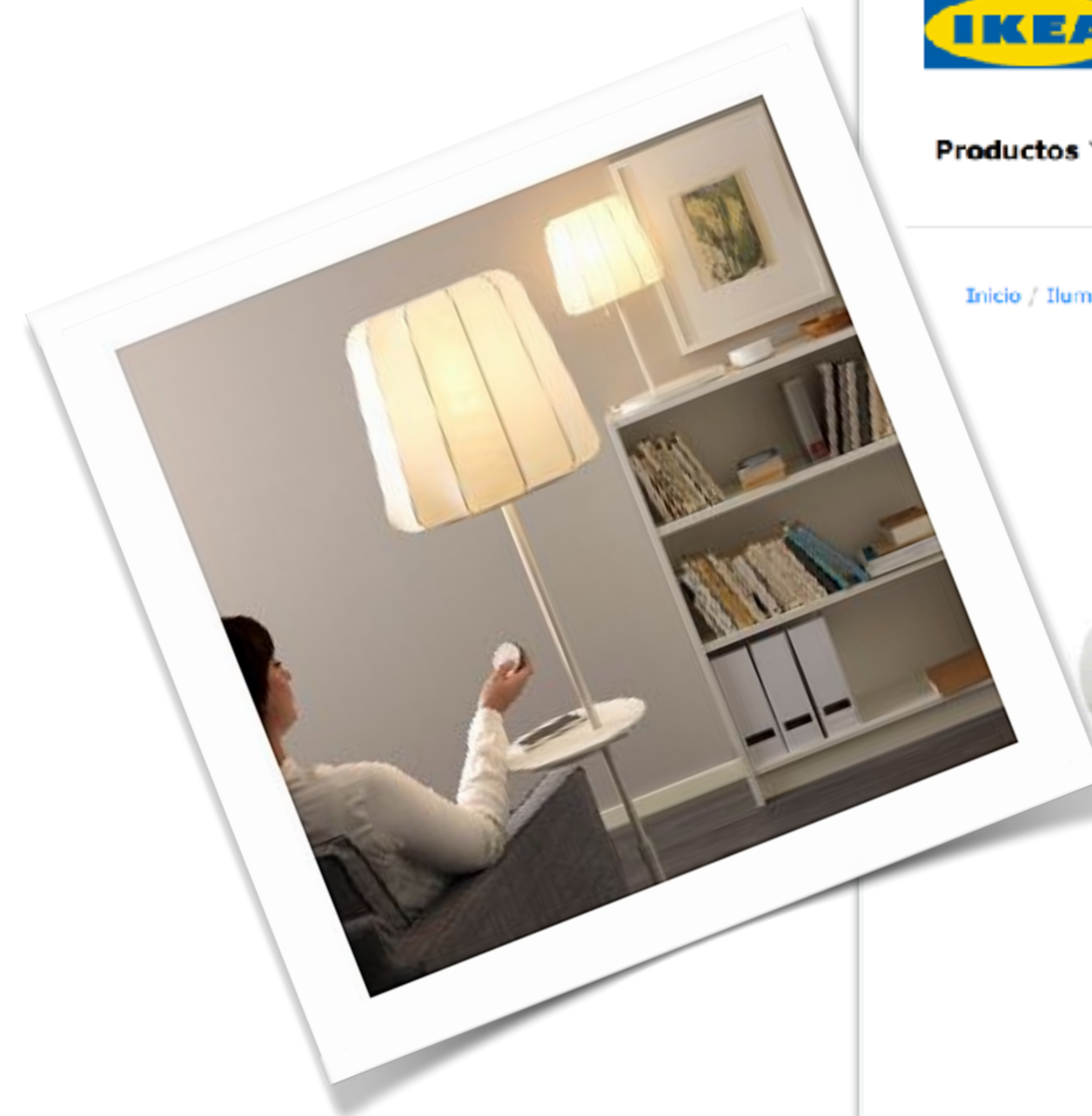
`3300` -> Temperature Sensor

`0` -> instance 0 of a Temperature Sensor

`5700` -> resource having the current value or a most recent reading

- Implemented in Wakaama, Leshan, Contiki, LWMQN, BIPSO and products that use LWM2M.
- Available in multiple IoT OS: Contiki, RIOT, Mbed, Zephyr...

IKEA TRÅDFRI



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IETF and IoT Work

- IETF's role: Specify the underlying, fundamental Internet Technologies.
- “Permissionless innovation” - so that others can build on top.

LWIG (Guidance)	DICE (DTLS)	6LoWPAN (802.15.4)
COSE (Object Security)	ROLL (RPL routing)	6Lo (IP-over foo)
ACE	6TiSCH	Architectural oversight (IAB)
CoRE (CoAP + extras)	CBOR (Constrained Binary Object)	LPWAN
		T2TRG (Research)

IETF CoRE WG

- 12 documents that are WG items.
- Base of current LWM2M.
- Addressing CoAP protocol, security, linking, discovery, congestion control, data serialisation, modelling in YANG, HTTP Proxying, Publish-Subscribe...
- Some of them recently updated like Resource Directory or CoAP over TCP.
- <https://github.com/core-wg/>
- More drafts on the pipeline ...

Working Group Documents:

Draft name

Active:

draft-ietf-core-coap-pubsub
draft-ietf-core-cocoa
draft-ietf-core-comi
draft-ietf-core-dynlink
draft-ietf-core-echo-request-tag
draft-ietf-core-interfaces
draft-ietf-core-object-security
draft-ietf-core-rd-dns-sd
draft-ietf-core-resource-directory
draft-ietf-core-senml
draft-ietf-core-sid
draft-ietf-core-yang-cbor

IESG Processing:

draft-ietf-core-coap-tcp-tls
draft-ietf-core-links-json

Published:

Draft name
draft-ietf-core-block
draft-ietf-core-coap
draft-ietf-core-ctch
draft-ietf-core-groupcomm
draft-ietf-core-http-mapping
draft-ietf-core-link-format
draft-ietf-core-observe

Document collections: [epub](#) [mo](#)

Rev.	Dated	Status	Comments, Issues
-02	2017-07-03	Active	
-02	<i>new</i> 2017-10-30	Active	
-01	2017-07-18	Active	
-04	2017-09-14	Active	
-00	<i>new</i> 2017-10-30	Active	
-10	2017-09-14	Active	
-06	2017-10-25	Active	
-00	2017-07-03	Active	
-12	<i>new</i> 2017-10-30	Active	
-11	<i>new</i> 2017-10-30	Active	
-02	<i>new</i> 2017-10-30	Active	
-05	2017-08-08	Active	
-10	<i>new</i> 2017-10-30	IESG Evaluation::AD Followup	
-09	2017-07-03	IESG Evaluation::AD Followup	
Rev.	Dated	Status	Obsoleted by/(Update)
-21	2016-07-08	RFC 7959	
-18	2013-06-28	RFC 7252	(RFC 7959)
-04	2016-11-14	RFC 8132	
-25	2014-09-12	RFC 7390	
-17	2016-11-28	RFC 8075	
-14	2012-06-01	RFC 6690	
-16	2014-12-30	RFC 7641	

The document name you specified, "*draft-*core-*", matched multiple documents:
(There were 226 matches, and the list has been truncated. But if you want, you can [see them all.](#))

[sort by date](#) [sort by name](#)

30 Oct 2017	draft-ietf-core-coap-tcp-tls	txt pdf
30 Oct 2017	draft-ietf-core-resource-directory	txt pdf xml html
30 Oct 2017	draft-arkko-core-dev-um	txt pdf
30 Oct 2017	draft-ietf-core-sid	txt pdf xml html
30 Oct 2017	draft-mattsson-core-coap-actuators	txt pdf xml html
30 Oct 2017	draft-silverajan-core-coap-protocol-negotiation	txt pdf
30 Oct 2017	draft-liu-core-coap-delay-attacks	txt pdf
30 Oct 2017	draft-ietf-core-echo-request-tag	txt pdf xml html
30 Oct 2017	draft-ietf-jmap-core	txt pdf xml html
27 Oct 2017	draft-tiloca-core-multicast-oscoap	txt pdf
27 Oct 2017	draft-toutain-core-time-scale	txt pdf xml html
25 Oct 2017	draft-ietf-core-object-security	txt pdf xml html
30 Sep 2017	draft-mattsson-core-security-overhead	txt pdf xml html
22 Sep 2017	draft-dulaunoy-misp-core-format	txt pdf xml html
14 Sep 2017	draft-ietf-core-dynlink	txt pdf
14 Sep 2017	draft-ietf-core-interfaces	txt pdf
07 Sep 2017	draft-wang-core-opcua-transmission	txt pdf
22 Aug 2017	draft-hartke-core-pending	txt pdf
08 Aug 2017	draft-ietf-core-yang-cbor	txt pdf xml html
29 Jul 2017	draft-hartke-core-e2e-security-reqs	txt pdf
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23 Jun 2017	draft-urien-core-identity-module-coap	txt pdf
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09 Jun 2017	draft-urien-core-racs	txt pdf
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27 Mar 2017	draft-amsuess-core-request-tag	txt pdf xml html
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10 Mar 2017	draft-groves-core-senml-options	txt pdf xml html
21 Feb 2017	draft-groves-core-obsattr	txt pdf xml html
20 Feb 2017	draft-becker-core-coap-sms-gprs	txt pdf
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18 Jan 2017	draft-vanderstok-core-comi	txt pdf xml html
06 Dec 2016	draft-garcia-core-app-layer-sec-with-dtls-record	txt pdf xml html
28 Nov 2016	draft-ietf-core-http-mapping	txt pdf xml html

14 Nov 2016	draft-ietf-core-etch	txt pdf xml html
31 Oct 2016	draft-thaler-core-redirect	txt pdf
29 Oct 2016	draft-vanderstok-core-coap-est	txt pdf xml html
27 Oct 2016	draft-vanderstok-core-yang-lwm2m	txt pdf xml html
27 Oct 2016	draft-cao-core-delegated-observe	txt pdf
23 Aug 2016	draft-veillette-core-cool-library	txt pdf xml html
18 Aug 2016	draft-vanderstok-core-cbor-yid	txt pdf xml html
16 Aug 2016	draft-bierman-core-yid	txt pdf xml html
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09 Mar 2015	draft-bormann-core-cc-qg	txt pdf
09 Mar 2015	draft-li-core-cbor-equivalents	txt pdf xml html

Possible LWM2M Additions



- *[RFC8132]* Support of PATCH/FETCH methods, it'd be greatly beneficial for firmware upgrade or observing relatively large sets of resources.
- *[RFC7641]* Support of observe between LWM2M Clients in order to subscribe to updates from one another.
- *[RFC8075]* In cases of GWs that need to implement a HTTP to CoAP proxy.
- *[RFC7049]* CBOR formatting instead of TLV.
- *[I-D.ietf-core-coap-tcp-tls]* **(updated)** outlines the changes required to use CoAP over TCP, TLS, and WebSockets transports.
- *[I-D.ietf-core-resource-directory]* **(updated)** Other than traditional LWM2M, CoAP's in-built discovery would be beneficial to support device-to-device cases. New version just published, <https://tools.ietf.org/html/draft-ietf-core-resource-directory-12>
- *[I-D.ietf-core-object-security]* **(updated)** For systems in which endpoints work behind a gateway or use LWM2M for managing the gateways, it might be good to implement other types of cryptographic protection than TLS/DTLS.
- *[draft-becker-core-coap-sms-gprs-06]* The CoRE WG would benefit greatly from feedback by the LWM2M community.

Assorted References

REST	https://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm
CoAP	https://tools.ietf.org/html/rfc7252
CoRE Link-Format	https://tools.ietf.org/html/rfc6690
CoAP Observe	https://tools.ietf.org/html/rfc7641
CBOR	https://tools.ietf.org/html/rfc7049
IOTSI	https://www.iab.org/activities/workshops/iotsi/
IOTSU	https://www.iab.org/activities/workshops/iotsu/
CoRE RD	https://datatracker.ietf.org/doc/draft-ietf-core-resource-directory/
LWM2M	https://github.com/OpenMobileAlliance/
CoMI	https://tools.ietf.org/wg/core/draft-ietf-core-yang-cbor/
WISHI	https://wishi.space
CoAP TCP+TLS	https://tools.ietf.org/wg/core/draft-ietf-core-coap-tcp-tls/
IPSO	http://ipso-alliance.github.io/pub/
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